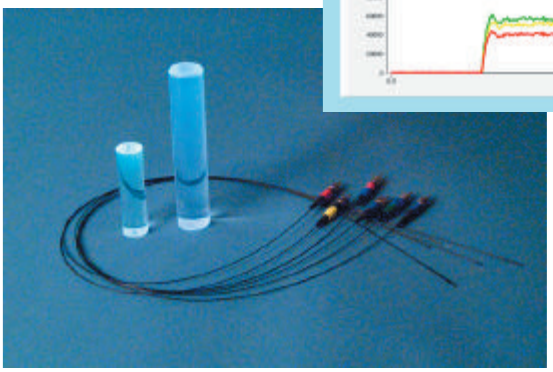
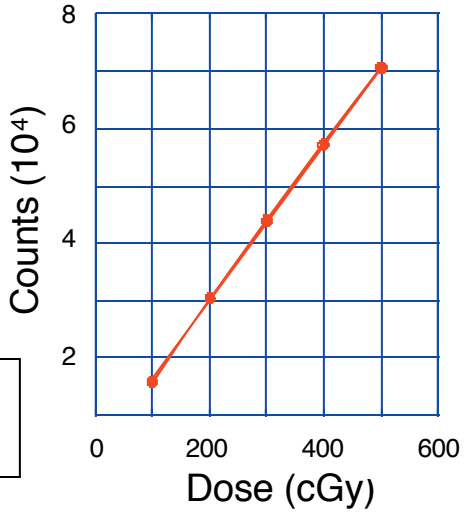
Optical Fiber Radiation Dosimeter

Optically Stimulable Luminscent (OSL) glass and fiber probes



User-friendly LabView interface displays dose rate and total dose



DESCRIPTION:

The Naval Research Laboratory (NRL) has developed a fiber-optic-coupled dosimeter based on NRL's patented luminescent glass. The glass, when exposed to short-wavelength light or ionizing radiation, emits fluorescence and stores trapped charge. The all-optical dosimeter can perform remote, in situ, real-time measurements of radiation doses, including in hazardous or inaccessible areas. The charge trapping characteristic allows for dose integration and subsequent read out at any convenient time.

ADVANTAGES/FEATURES:

- In situ, real-time measurement of dose rate and total accumulated dose
- High sensitivity over a wide range of doses
- Compact, low cost, optical probe (can be disposable or may be reused indefinitely)
- All optical → no electromagnetic interference
- Capable of withstanding exposure to moisture, high temperatures, and corrosive environments
- No heavy metals; environmentally and biologically friendly
- Easily manufactured in large quantities
- Licensable under the following US patents: 5,585,640; 5,606,163; 5,656,815; 5,811,822; 6,087,666; 6,140,651; 6,153,339; 6,211,526 B1; and 6,307,212 B1

APPLICATIONS:

- Medical: real-time dose monitoring during diagnostic and therapeutic X-ray procedures.
  - — In vivo, real-time, patient dose monitor for radiotherapy
  - — Fluoroscopic procedures (prevent or reduce skin injury)
- Environmental monitoring: remote monitoring of radiation in nuclear facilities or in soils or groundwater. Fiber-optic-coupled sensors can be located several kilometers from readout unit.

CONTACT:

Licensing information:
Jane F. Kuhl • Head, Technology Transfer Office • (202) 767-3083 • kuhl@utopia.nrl.navy.mil
Technical information:
Dr. Alan L. Huston • Optical Sciences Division • (202) 767 -9470 • alan.huston @nrl.navy.mil
Dr. Brian L. Justus • Optical Sciences Division • (202) 767-9468 • justus@ nrl.navy.mil